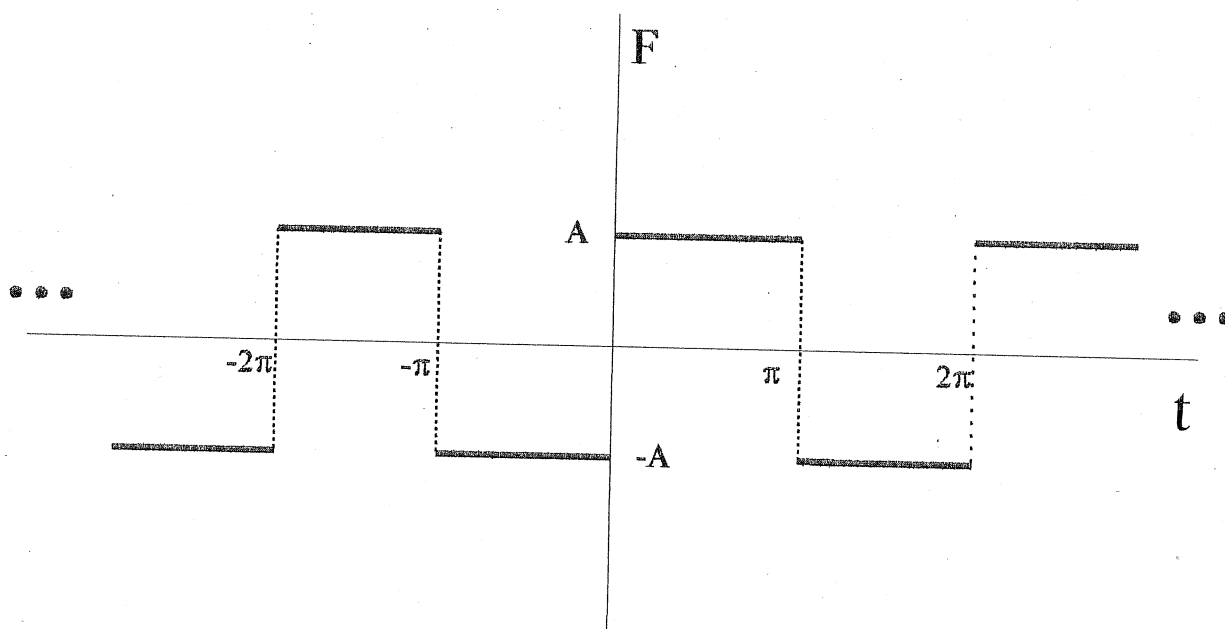


Physics 105A  
Problems due October 1

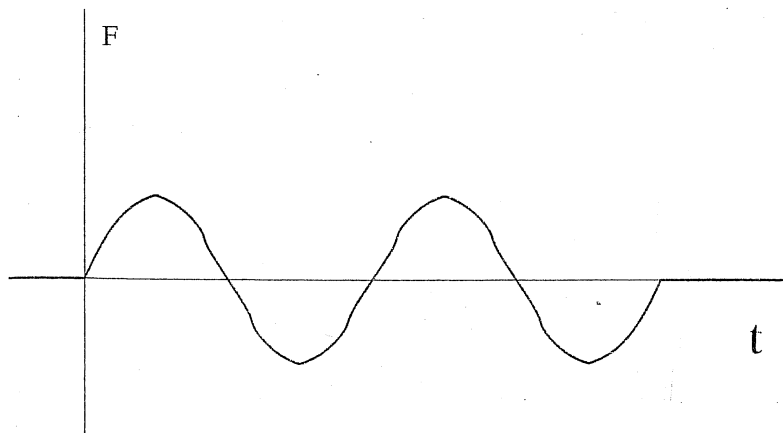
C3. A block of mass  $m$  is attached to a spring with force constant  $k$ ; the damping coefficient is  $\beta$ . The driving force  $F(t)$  (which is graphed below) is periodic with period  $(2\pi)$ ; it is given by  $F(t) = -A$  for  $t$  from  $-\pi$  to  $0$ , and  $F(t) = +A$  for  $t$  from  $0$  to  $+\pi$ , where  $A$  is a constant. Write the series expression for the particular solution  $x_p(t)$ .



C4. Again, mass  $m$ , force constant  $k$ , but this time  $\beta=0$ . The block is at rest for  $t < 0$ ; then a driving force is applied. For some integer  $n$ , the driving force is given by

$$F(t) = A \sin(\omega_0 t) \text{ for } 0 < t < \frac{2\pi n}{\omega_0}; \quad F(t) = 0 \text{ for } t > \frac{2\pi n}{\omega_0}.$$

For example, for  $n = 2$ ,  $F$  looks like this:



Find  $x(t)$  for  $t > \frac{2\pi n}{\omega_0}$